East-West migration and gender: Is there a "double disadvantage" vis-à-vis stayers?*

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Abstract

This paper examines whether female East-West migrants in Germany after the reunification face an additional disadvantage after they move compared to both stayers and males. It employs panel data techniques to take account of unobserved heterogeneity. I find that migrant women after migration neither experience a drop in relative employment, nor earn lower relative hourly wages. They do, however, work relatively less hours and have a lower relative annual income. The results also suggest that for them, the income effect dominates the substitution effect and they substitute market work with home production, in particular with childcare.

JEL Classification: J16, J61, R23.

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1 Introduction

Gender differences among migrants are often more substantial than among the local population in general. Boyd (1984) postulates that "...in addition to the status of being a migrant, immigrant women experience additional difficulties in the labor force as women..." (p. 1092). Empirical studies have investigated whether immigrant women face a so-called "double disadvantage" of being both a female and a foreign-born with respect to labor force participation and employment (Rebhun, 2006, De Jong and Madamba, 2001, Raijman and Semyonov, 1997, Boyd, 1984, Kats, 1982), wages (De Jong and Madamba, 2001, Haberfeld, 1993, Kossoudji and Ranney, 1984), occupational status and job mobility (Raijman and Semyonov, 1997, Boyd, 1984) and job mismatch (De Jong and Madamba, 2001). All of them analyze female immigrants' labor market status in the receiving country, comparing them to males and to native females.

On the other hand, understanding how female migrants perform relative to *stayers* is crucial in order to complete the picture. A parallel question of interest is: Do female migrants experience a gain in their relative labor market outcomes after migration, or do they experience a (double) disadvantage with respect to their male counterparts as well as the sending country's population? This paper attempts to answer this question.

Neoclassical theory of migration postulates that migration occurs if the present discounted value of the lifetime income stream in the destination region, net of migration costs, is higher than the one in the source region. Migrants are often viewed as being positively self-selected with respect to the sending country population, and thus, on average, being more likely to engage in labor market activities and to earn higher wages in the receiving country. However, family migration models (starting with Mincer, 1978) emphasize that the decision to move is a joint decision by the family and women are typically viewed as "tied" movers. Being tied to their husbands they do not necessarily experience a gain from migration. Family investment models, on the other hand, postu-

late that, willing to maximize the joint returns to migration, married female migrants in the early stage of emigration engage in labor market activities and are the main income earners, while their husbands invest in the human capital of the host country and are expected to contribute to the family budget later on (Duleep and Dowhan, 2002, Baker and Benjamin, 1997, Duleep and Sanders, 1993).

A second contribution of this paper is that it analyzes gender and migration in the context of the transition economy of East Germany, which is becoming an increasingly relevant issue in light of the recent EU enlargements and European East-West migration. In East Germany, a so-called "sex blindness" policies applied under communism with labor force participation of women being high (more than 80 percent). It remained relatively high also after the reunification (72 percent in May 2000) (Bonin and Euwals, 2005). However, their employment fell more than that of men, and the gender wage gap has narrowed due to the exit from employment of low skilled women (Hunt, 2002). At the same time, fertility declined (Lechner, 2001), as did the availability of childcare facilities, which is, however, still larger in eastern than in western Germany (Wrohlich, 2004). Finally, the majority of migrants from East to West Germany were women (see Figure 1).

This paper describes the labor market performance of female migrants from East to West Germany over 1990 - 2001, a decade after the reunification, comparing them both to stayers and males. It documents the relation between being both a female and a migrant and four outcomes of interest: annual income, employment, hours worked per week and hourly earnings. It uses the German Socio-Economic Panel (GSOEP), which is a longitudinal dataset that contains information on both pre- and post- migration histories of migrants as well as information on stayers. Given that there are both pre- and post- data available for the same individuals, I use a sort of "difference-in-difference-in-difference" approach. Having panel data also allows differencing away time-invariant unobservable confounders. Thus, to the extent that self-selection into migration is influenced by time-

invariant unobservables, this approach identifies a causal effect of being a female migrant on labor market performance.

The main results of this study are as follows. I find that migrant women after migration neither experience a drop in relative employment, nor earn lower relative hourly wages, compared to the change in relative outcomes of stayers. They do, however, work fewer hours and have a lower relative annual income. The results also suggest that engaging in childcare activities, having a husband in the West or a partner with a higher income contribute to the explanation of this effect, indicating that female migrants in the West seem to substitute some market work with home production, in particular childcare. This negative effect is most likely attributable to the combination of both demand factors on the one hand, such as availability of part-time vacancies in the West, and supply factors on the other hand, such as reduced labor supply due to the childcare activities and insufficiency of childcare institutions.

The rest of the paper is structured as follows. Section 2 describes the data and presents descriptive evidence. Section 3 outlines econometric methodology and discusses the results. Some explanations are suggested in section 4, section 5 explores migration within western German states, and section 6 provides a robustness analysis. Section 7 concludes.

2 Data and descriptive evidence

The paper exploits 1990-2001 waves of the eastern sample of the German Socio-Economic Panel survey (GSOEP).[1] In the GSOEP, eastern Germans are traced if they move to western Germany. Thus, the main advantage of this dataset is that it has both pre- and post-migration information for the same individuals, while a small number of observations

[1] See SOEP Group (2001) for a description of the dataset.

for movers constitutes the main disadvantage.

The outcomes of interest are constructed as follows. The total annual individual income is a sum of individual earnings from the main job, second job and self-employment, and the social security benefits (such as unemployment benefits, maternity benefits etc.). The mean income is set to missing only if information on all the components is missing.[2] Employment is a dummy that equals one if an individual is working, and is zero otherwise. Hours per week are reported hours worked per week. Finally, hourly earnings are calculated as monthly earnings (wages and salaries from main job, second job and self-employment) divided by the number of hours worked per week, further divided by 4.3.[3] All financial variables are inflated to 2001 by regional CPIs and are expressed in DM.

The migrants' group includes all persons that experienced migration during 1990-2001, and the stayers' group comprises those who stayed in the East during 1990-2001. I concentrate on working age individuals (18-54 years old) for whom the data on the key variables are not missing.[4] Final sample sizes vary with the dependent variables used and range from 18,126 to 8,984 observations, 425-1,169 of whom belong to the migration group (actual and potential migrants).[5]

Table 1 provides socioeconomic characteristics for migrants and stayers by gender for the periods "before" and "after".[6] As can be seen from this table, migrants on average are younger and are less likely to be married than stayers both "before" and "after". The

[2]I also exclude the obvious outliers from the sample, i.e. individuals whose average annual income is less than 1,000 DM or greater than 130,000 DM.

[3]I also exclude the outliers, i.e. those earning less than 100 DM or more than 20,000 DM per month.

[4]The upper bound of age is chosen due to the early retirement schemes. Individuals in full-time education and military service as well as return migrants are excluded. I also exclude commuters from stayers, since they constitute a specific group, but keep them in the robustness checks. Finally, I keep only those for whom the data is observed for both "before" and "after" periods.

[5]In the sample, around 6 percent are migrants. This number is consistent with the aggregate figures.

[6]Note that for the analysis below I have to define pre- and post- periods also for stayers. I define 1990-1995 as a "pre-" period, and 1996-2001 as a "post-" period. While this definition is somewhat arbitrary, the main results hold also with different year thresholds.

proportion of both male and female migrants with university degree is almost the same as that of stayers "before", although this proportion is much higher for migrants after migration, with male migrants on average being more educated than females. Since not all human capital acquired in the East is transferrable to the West, it seems that migrants do invest in their human capital in the West.

Table 2 presents labor force behavior for males and females. The pooled data reveals that there are fewer unemployed among male migrants than among stayers after migration, however this trend does not hold for migrant women, with 95 percent of males and 75 percent of females being employed after migration. Large differences between genders exist in part-time work before and after migration: while 7 percent of female migrants work part-time before move (18 percent of female stayers and 3 percent of male migrants do so), the proportion increases to 40 percent after they move (compared to 18 percent of female stayers and virtually 0 percent of male migrants). Table 2 shows also occupational distribution of males and females before and after migration. Females, both stayers and migrants before and after the move, tend to be concentrated in the technician and associate professional jobs, the second largest group being service and sales workers. Males are concentrated in craft, construction and related trades occupations, the second largest group being plant and machinery operators. There seems to exist no descriptive evidence of the downward occupational mobility after migration.

Tables 1 and 2 display also the outcomes of interest. A number of features are worth noting. First, Table 1 shows that the annual income of male migrants after migration is much higher than their initial income before migration, and is also higher than the income of stayers. The income of females, however, does not follow this trend: in the period after migration, the annual income of female migrants seems to be even lower than the annual income of female stayers. Second, while the differences in employment and hourly wages in all groups are not large before migration (with the exception of

employment for males), they become obvious after migration with male migrants working more and female migrants working less than stayers (see Table 2). Third, there is a striking difference in hours worked between migrant men and women (Table 2): while before migration migrants and stayers have an almost equal amount of hours worked per week (with males on average working roughly 5 hours more than females), after the move, the average number of hours increases for migrant men from 46.49 to 46.70, but drops for women from 41.41 to 32.80, and the proportion of migrant women working part-time increases from 7 percent to 40 percent. Fourth, both male and female migrants earn higher hourly wages than stayers after migration, and the gender pay gap exists for migrants both before and after migration (Table 1). Finally, it is worth noting that overall there exist some systematic differences in outcomes of migrants and stayers even before migration occurs. It is possible that the endogeneity of migration decision generates these differences, or that they are due to differences in observable characteristics between migrants and stayers. These issues are addressed in the following section.

Before controlling for observed heterogeneity, however, it is also useful to undertake another descriptive exercise and to compare the differences in means between migrants and stayers by gender (a sort of "difference-in-difference-in-difference" exercise). Table 3 illustrates these unadjusted estimates. Each panel compares the change in the respective outcome along three dimensions of variation. The first is the comparison of the periods before and after migration, the second difference is between migrants and stayers, and the third one is between men and women. Each cell contains the mean average outcome for the group labeled on the axes, along with the standard errors. Does the differentiation of the labor force by sex and mobility status operate to the "double disadvantage" of migrant women? The answer appears to be "yes" in terms of annual income, employment and hours worked per week. However, this does not seem to be the case for hourly wages - there is a fall in relative hourly earnings of female migrants compared to the change in

relative hourly earnings of stayers, however it is not significant. This descriptive exercise provides some evidence that female migrants face a decrease in certain labor market outcomes relative to male migrants and stayers after they move. However, the causal interpretation of this effect is problematic, since there exist important observable and unobservable characteristics that confound it. The econometric analysis below addresses these issues.

3 Regression framework and estimation results

Table 3 does not control for the observed heterogeneity between the groups, such as human capital and demographics. The regression equation that controls for these observable characteristics has the following form:

$$\begin{aligned} Y_{i,t} &= \beta_1(F_i \times M_i \times A_t) + \beta_2(F_i \times M_i) + \beta_3(F_i \times A_t) + \beta_4(M_i \times A_t) + \\ &+\beta_5 M_i + \beta_6 F_i + \beta_7 A_t + \delta X_{i,t} + \eta_t + \varepsilon_{i,t} \end{aligned} \tag{1}$$

where $Y_{i,t}$ is the outcome variable of individual i in year t, F_i indicates if an individual i is a female, M_i indicates if she belongs to the migrants' group, A_t is a dummy that equals 1 for the period "after" and is 0 otherwise, $X_{i,t}$ is a vector of control variables, η_t are year fixed effects, and $\varepsilon_{i,t}$ is an error term assumed to be uncorrelated with other variables.

The coefficient β_1 on the third-level interaction is our parameter of interest. It captures all variation in labor market outcomes specific to migrants (relative to stayers) to females (relative to males) in the years after migration (relative to before). The second-level interactions control for time-invariant characteristics of the migrant females (β_2), changes over time for all females (β_3), and changes over time for the migrants' group (β_4). Finally,

the migrant dummy controls for any time-invariant characteristics of the migrants (β_5), female dummy - for time-invariant characteristics of females (β_6), and "after" dummy - for the time-series changes in outcomes.

Tables 4-7 present the estimation results for different outcomes.[7] In all tables column (1) reports the estimates from an OLS regression without controls, column (2) adds standard controls such as age and its square, marital status, number of children less than 14 years old, education, blue-collar and public sector employment dummies, year and region fixed effects, and column (3) adds a lagged hourly wage as a proxy for skills. Further columns include additional controls and pre-determined covariates. Finally, in the last columns I also control for individual fixed effects.[8]

Do female migrants after migration experience a significant income loss relative to males and stayers? The first row of Table 4 presents the estimate of the effect on the annual income. As can be seen from this table, the answer appears to be yes. The effect holds with the addition of controls, and even the fixed effects estimation indicates that female migrants face a significant 24-32 percent drop in relative annual income after they move on top of the effects for all migrants and all females.

Other coefficients are also worth noting. Fixed effects estimation results show that the effect for all migrants after they move relative to stayers is positive and economically and statistically significant. There exist no robust evidence for the effect for all females in the period "after". Neither the time-invariant effect for female migrants nor the migration dummy is statistically significant. Females receive lower annual income than males. The coefficients on the other covariates are as expected[9]: experience has a concave profile,

[7] Note that sample size changes when lagged hourly earnings and pre-determined controls are included, however, the main results hold in spite of the changes in composition. To compare the effect, columns with the same number of observations have to be considered.

[8] Note that if unobservables are not time-invariant and are positively correlated with the probability to move, the estimation results are biased upwards and constitute the "upper bound" of the true effect.

[9] available upon request.

university graduates earn higher annual income, those with a general schooling degree receive lower income relative to apprentices, public sector employees have higher income, and the coefficient on the lagged wage is positive and significant. Thus, even after having controlled for skills and individual fixed effects, the relative effect for female migrants on annual income remains negative and highly significant.

Table 5 shows analogous estimates for employment probabilities. In contrast to annual income, female migrants do not face significantly lower relative employment probability after they move. The effect changes sign, however remains statistically insignificant across all specifications, with the exception of OLS(1) and OLS(3). The positive and significant effect of migrants after migration disappears in the fixed effects estimation, but all females in the period "after" seem to have higher relative probability of being employed (in six out of eight specifications). Employment prospects seem to worsen over time, and both coefficients on time-invariant migrant and female dummies are negative and significant in the majority of specifications. Coefficients on age, marital status, number of children, schooling and lagged wage have the expected signs.

Table 6 presents the results for hours worked per week.[10] If being a female migrant does not influence the relative employment outcome after migration, it does appear to influence the relative weekly hours worked. The coefficient on the third-level interaction is negative and statistically significant in all model specifications. Moreover, the magnitude of the effect diminishes only slightly with the inclusion of additional controls: female migrants experience a 22-27 percent decrease in relative weekly hours worked after they move. Moreover, the coefficient on the second-level interaction $female \times after$ is also negative and statistically significant, indicating that in the period "after" all females face a drop in their weekly working hours. Finally, a negative and significant coefficient

[10] These are hours worked conditional on being employed. Note that due to the high labor force participation of females in East Germany, the selection into the labor force problem can be ignored here. Labor supply and wages can be modelled jointly, however, this is beyond the scope of this paper.

on female dummy indicates that, in general, females work less hours relative to males. The coefficients on all other controls have the expected signs. Overall, even after having controlled for skills and individual fixed effects, the relative effect for female migrants on hours worked remains negative and highly significant.

Finally, Table 7 presents estimation results for hourly earnings. As can be seen from this table, there exists no additional effect of being a female migrant on hourly wages (the only exception is OLS(2)). Coefficients on the second-level interaction $female \times after$ is positive and significant in all specifications but one, indicating a 3-6 percent increase in the relative hourly wages of females in the period "after". The gender wage gap, however, exists with females earning on average 7-16 percent less than males. The remaining coefficients are as expected: experience has a concave profile, university graduates earn more relative to apprentices, blue-collar workers earn less than white-collar employees and public sector employees have higher hourly earnings.

Overall, the regression analysis indicates that there exists an additional negative effect for female migrants after migration on their annual incomes and hours worked, but not on employment likelihood and hourly earnings.

4 Searching for explanations

So far, we have established that compared to stayers and male migrants, female migrants in the West face a drop in their relative weekly working hours and annual incomes. Migrant women seem to switch to part-time work after migration, and thus receive a lower relative annual income. But is this effect equally distributed across all female migrants? Is it a voluntary choice or a disadvantage, preferences or demand? It is difficult to disentangle true preferences, and the analysis below attempts to at least suggest some potential answers.

Table 8 shows the effect for different groups indicated in each row. For example, when the effect is estimated for a subpopulation of married individuals (see the first panel), it is still negative and significant. The same holds for the subpopulation of married with children (second panel), married before migration (third panel) and for those with children before migration (fourth panel). On the other hand, when the estimations are made for a subpopulation of singles, the effect becomes insignificant. Thus, fertility and marriage constitute potential explanations of the negative effect. In addition, potential endogeneity does not seem to be a problem, since the additional negative effect is present conditioning on being married or having children before migration, as well as on having worked before migration.

These findings indicate several interesting facts. First, the results in Table 8 suggest that the effect is heterogenous across different demographic groups. Second, the group that experience an additional negative effect on the supply of working hours and on annual income is the one consisting of married female migrants after migration (with or without children). For singles, being a female and a migrant influences their relative labor market outcomes insignificantly. Thus, family background matters, and merits a more detailed exploration.

Could family characteristics explain this additional negative effect of being a female migrant on relative annual income and weekly hours? Table 9 provides an answer. In this table, I have reestimated the baseline model in equation (1) including the additional interactions of the effect ($F_i \times M_i \times A_t$) with other variables. If it is true that these variables reinforce the effect for female migrants, we should see a significant coefficient on these additional interactions and β_1 should either decrease in magnitude or become insignificant.[11] Indeed, the first panel of Table 9 indicates that the marital status contributes to the explanation. The interaction with the spouse dummy is negative and statistically

[11] This exercise is similar to the one in Ichino et al. (2006).

significant for both annual income and hours worked, while the $(F_i \times M_i \times A_t)$ dummy becomes insignificant. Having children younger than 14 years old and being a female migrant has an effect on the relative annual income, but the impact is insignificant for hours worked after migration. On the other hand, there seems to be no additional effect from already having a spouse before migration.[12] In addition, spending time for childcare contributes significantly to the explanation of the effect on hours supplied, and the $(F_i \times M_i \times A_t)$ dummy becomes either insignificant or smaller in magnitude. Finally, the income of other household members also contributes significantly to the explanation of this effect:[13] a higher partners' (or other household members') income significantly reduces the relative annual income and hours worked for female migrants after migration, while the $(F_i \times M_i \times A_t)$ effect again becomes either insignificant or smaller in magnitude.

This exercise suggests that family background is indeed a potential reason behind a negative relative effect for migrant women: having a husband, having a higher income of other members of the household, and spending time for childcare is associated with working less hours and receiving a lower annual individual income. In contrast, being married already before migration does not have any additional effect on the outcomes of interest. Migrant women who have a spouse in the West or who live in "rich" households reduce their supply of labor market hours. Since the wage rate increases after migration (see Table 1), it appears that the income effect dominates the substitution effect for these females. After migration, they may switch either to more leisure, or to household production including childcare. Indeed, since spending time for childcare has a separate negative effect for these females, it implies that childcare is another potential explanation.

[12] "Married before" dummy is equal to 1 if an individual was married one year before and in the year of migration.

[13] This variable is constructed as the difference between monthly household income and monthly income of an individual i in year t. I also experimented with individual partner's income, although the sample size dropped significantly. While the results were qualitatively the same, my preferred variable is the income of other household members.

Since the availability of childcare facilities is better in East Germany than in the West[14], and since relatives, who could potentially contribute to the childcare activities, are usually left in the East, at the margin, female migrants substitute their market work in the West with childcare. The opportunity costs of home production seem to be higher for female migrants. On the other hand, they may also face an increased availability of the part-time jobs in the West that were not available in the East, or, conversely, a decreased demand for full-time jobs. Overall, the negative relative effect on working hours and incomes is most likely to be due to the combination of both supply and demand factors. A decreased availability of childcare facilities combined with the decreased demand for full-time jobs point towards the involuntary choice as the most likely explanation.

5 The effect in western Germany

One remaining question that has to be addressed is whether the double negative effect found above is specific for transition economies or does it also hold in other contexts? This section provides an answer and, to this aim, examines the relation between having a female migrant status and four labor market outcomes of interest for the within-western German migration only.

In order to be consistent with the analysis above, I have tried to follow closely definitions and sample selection rules. In particular, the four labor market outcomes of interest are defined as in Section 2, and the time period is the same: 1990-2001. The definition of migrants, however, changes, since now migrants include those individuals who change their residence from one western German state (*"Bundesland"*) to another over 1990-2001. I again concentrate on working age individuals (18-54 years old) for whom the data on

[14]For example, in 1990 there were 54.2 childcare places available per hundred children under the age of three in East Germany, while there were only 1.8 such places in the West. The number has dropped for the East and increased slightly for the West, but there are still significant differences with 36.3 places and 2.8 places in 1998, respectively (see Wrohlich, 2004).

the key variables are not missing.[15] The final sample size ranges from 26,378 to 32,377 observations.

Table 10 presents estimation results. As can be seen from this table, female inter-state migrants in western Germany experience insignificant additional effects with respect to employment probability and hourly earnings. However, the additional effect on weekly hours and annual income is, if anything, positive. The fixed effects estimation results suggest that, compared to males and stayers, female migrants after migration have both higher working hours and higher annual incomes in western Germany.

Thus, this analysis suggests that the additional negative effect on the supply of working hours and on annual incomes is specific for women who move between regions with different institutions, such as East and West Germany, among which childcare facilities and availability of part-time jobs are important.

6 Sensitivity analysis

In addition to changes in the specification of the baseline model (see Tables 4-7), several robustness checks were undertaken. Table 11 shows this sensitivity analysis.

First, I have controlled for additional household-level characteristics, such as total household size and household income (panel A). The fixed effects estimation results show that migrant females after migration experience an additional 24 percent drop both in their relative annual income and in relative weekly hours worked. Second, in panel B, I have included detailed controls for occupation (nine occupational groups according to ISCO88 definition). Again, the results were not affected: while the negative effect on income was

[15] Again, individuals in full-time education and military service as well as return migrants are excluded. However, inter-state commuters are included in the "stayers" group, since it is not possible to identify them in the data for West Germany (this is comparable with the robustness checks for the East-West analysis below). Finally, I keep only those individuals for whom the data is observed for both "before" and "after" periods.

24 percent in fixed effects estimation, the effect on hours equaled to 26 percent. Finally, to check how robust the results were to different definitions of the control group, in panel C, I have retained commuters in stayers' group. These are individuals who reside in eastern Germany and work in western Germany, and for whom the impact of family background is likely to be more similar to stayers than to migrants. The additional negative effect for annual income was 24 percent, while the effect for weekly hours equaled to 25 percent. In all panels, the relative effects for employment and hourly earnings were insignificant. Overall, the main results remained robust to changes in the definition of the control group and to the inclusion of additional controls.

7 Conclusions

This paper documented the relative labor market performance of female migrants from East to West Germany over 1990-2001, comparing them to males and stayers. A sort of "difference-in-difference-in-difference" methodology and panel data techniques were used to purge away time invariant unobservable confounders.

The main results indicate that female East-West migrants after migration experience an additional negative effect on their relative annual incomes and hours worked, but not on the relative employment probabilities or hourly wages. This is consistent with standard labor supply model, and suggests that for these females the income effect dominates the substitution effect.

Moreover, the negative effect is heterogenous across different demographic groups and is not present for single female migrants. The family background thus serves as a potential explanation, and the results also suggest that having a husband in the West, having a higher partner's income, having children and spending time for childcare indeed contribute to the explanation of this negative effect. Thus, female migrants in the West seem to

substitute some market work with home production, in particular with childcare.

Moreover, this additional negative relative effect on working hours and incomes has demonstrated to be specific to the transition economy structure of East Germany. Overall, the additional negative effect for East-West female migrants remains robust to changes in specification and in the sample, and is most likely to be attributable to the combination of both supply and demand factors.

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8 Appendix

Table 1: Socioeconomic characteristics by gender and mobility status "before" and "after"

	Males		Females	
	Stayers	Migrants	Stayers	Migrants
	before			
Age	36.12	31.79	35.91	31.01
	(8.84)	(9.39)	(8.61)	(9.33)
Married	0.71	0.51	0.77	0.49
Number of kids<14 y.o.	1.07	0.83	1.13	1.03
	(1.00)	(0.98)	(0.99)	(0.94)
General school	0.07	0.16	0.08	0.20
University	0.12	0.15	0.08	0.09
Other technical or vocational training	0.16	0.08	0.19	0.13
Observations	[3670]	[196]	[4562]	[304]
Annual income	39209.18	37921.29	29799.78	29832.13
	(17643.66)	(21807.53)	(17010.30)	(22217.62)
Observations	[3419]	[184]	[4206]	[274]
Hourly earnings	19.92	19.01	19.02	18.12
	(11.95)	(11.42)	(14.97)	(12.23)
Observations	[2894]	[142]	[3008]	[184]
	after			
Age	39.61	37.55	39.63	35.35
	(8.72)	(8.60)	(8.50)	(9.22)
Married	0.67	0.64	0.73	0.69
Number of kids<14 y.o.	0.82	0.84	0.88	0.91
	(0.94)	(0.96)	(0.93)	(0.90)
General school	0.04	0.04	0.05	0.08
University	0.12	0.25	0.08	0.14
Other technical or vocational training	0.25	0.18	0.28	0.24
Observations	[3866]	[259]	[4859]	[410]
Annual income	40096.95	57016.90	31943.42	30998.65
	(19357.46)	(25349.15)	(19566.65)	(22053.43)
Observations	[3339]	[228]	[4162]	[329]
Hourly earnings	20.88	27.87	20.96	25.37
	(16.30)	(14.34)	(19.14)	(24.90)
Observations	[2765]	[215]	[3080]	[270]

Note: standard deviations in parentheses. "Before" stands for a period before moving West for migrants and before 1996 for stayers, "after" stands for a period after individual move for migrants and after 1996 for stayers. See text for definitions. Annual income is a sum of labor income and social security benefits. Hourly wage includes wages and salaries from main job, second job and self-employment. All financial variables are inflated to 2001 by regional CPIs and expressed in DM. Reference categories: single, apprenticeship.

Table 2: Labor force behavior by gender and mobility status "before" and "after"

	Males		Females	
	Stayers	Migrants	Stayers	Migrants
			before	
Employed	0.90	0.84	0.76	0.73
Blue collar	0.50	0.46	0.17	0.11
Observations	[3670]	[196]	[4562]	[304]
Part-time work	0.04	0.03	0.18	0.07
Hours per week	45.19	46.49	40.01	41.41
	(9.14)	(9.21)	(9.02)	(7.19)
Observations	[3096]	[151]	[3247]	[200]
Occupation (in %):				
managers	7.08	7.05	3.66	2.79
professionals	12.10	5.13	13.80	10.70
technicians, assoc. professionals	9.63	7.69	30.37	40.47
clerks	2.99	5.13	17.69	17.67
service, sales workers	4.77	10.26	18.61	17.21
agricultural, fishery workers	1.79	1.92	1.59	1.40
craft, construction workers	39.55	23.72	5.25	3.72
machinery operators	14.71	23.72	3.30	0
elementary occupations	7.17	7.69	5.72	6.05
armed forces	0.22	7.69	0	0
			after	
Employed	0.84	0.95	0.76	0.75
Blue collar	0.46	0.55	0.17	0.13
Observations	[3866]	[259]	[4562]	[410]
Part-time work	0.03	0.004	0.18	0.40
Hours per week	45.89	46.70	40.00	32.80
	(9.47)	(9.35)	(9.02)	(11.90)
Observations	[3153]	[239]	[3247]	[301]
Occupation (in %)				
managers	7.29	5.42	3.66	2.07
professionals	12.78	14.17	13.80	11.72
technicians, assoc. professionals	10.48	11.67	30.37	37.24
clerks	3.66	3.75	17.69	18.97
service, sales workers	4.51	1.67	18.61	20.00
agricultural, fishery workers	2.56	0.42	1.59	0
craft, construction workers	38.37	29.58	5.25	1.03
machinery operators	12.31	22.92	3.30	4.14
elementary occupations	8.02	9.17	5.72	4.83
armed forces	0.03	1.25	0	0

Note: standard deviations in parentheses. See footnote of Table 1.

Table 3: Differences in labor market outcomes by gender and mobility status

	Before		After		After - before	
	Males (1)	Females (2)	Males (3)	Females (4)	Males (5)	Females (6)
	log total annual income					
Stayers	10.450	10.104	10.456	10.150	0.006	0.047***
	(0.010)	(0.011)	(0.010)	(0.011)	(0.015)	(0.016)
Migrants	10.333	10.006	10.840	9.994	0.508***	-0.011
	(0.054)	(0.050)	(0.034)	(0.052)	(0.062)	(0.073)
M-S	-0.117***	-0.098**	0.385***	-0.156***	0.502***	-0.058
	(0.043)	(0.044)	(0.041)	(0.043)	(0.064)	(0.075)
DDD					-0.560***	
					(0.099)	
	employment					
Stayers	0.896	0.759	0.845	0.743	-0.051***	-0.016*
	(0.005)	(0.006)	(0.006)	(0.006)	(0.008)	(0.009)
Migrants	0.842	0.727	0.946	0.751	0.104***	0.024
	(0.026)	(0.026)	(0.014)	(0.021)	(0.028)	(0.033)
M-S	-0.054**	-0.032	0.101***	0.008	0.155***	0.040
	(0.023)	(0.025)	(0.023)	(0.022)	(0.029)	(0.034)
DDD					-0.115**	
					(0.045)	
	log weekly hours					
Stayers	3.787	3.656	3.800	3.625	0.013**	-0.030***
	(0.004)	(0.005)	(0.005)	(0.006)	(0.006)	(0.008)
Migrants	3.818	3.701	3.826	3.394	0.008	-0.307***
	(0.017)	(0.017)	(0.012)	(0.028)	(0.020)	(0.037)
M-S	0.032	0.046**	0.026	-0.231***	-0.005	-0.277***
	(0.020)	(0.021)	(0.017)	(0.022)	(0.021)	(0.038)
DDD					-0.272***	
					(0.043)	
	log hourly earnings					
Stayers	2.879	2.806	2.907	2.882	0.029**	0.076***
	(0.009)	(0.009)	(0.009)	(0.010)	(0.013)	(0.014)
Migrants	2.808	2.666	3.217	2.993	0.409***	0.327***
	(0.045)	(0.054)	(0.032)	(0.039)	(0.054)	(0.066)
M-S	-0.071	-0.140***	0.310***	0.111***	0.380***	0.251***
	(0.041)	(0.040)	(0.034)	(0.035)	(0.055)	(0.067)
DDD					-0.129	
					(0.087)	

Note: standard errors in parenthesis. Cells contain means of the respective labor market outcome. Before / after and migrants and stayers are defined in the text. DDD is the "difference-in-difference" for females minus that for males. *** significant at 1% level, ** significant at 5% level, * significant at 10% level.

Table 4: Estimation results: annual income

	OLS (1)	OLS (2)	OLS (3)	OLS (4)	FE (5)	FE (6)
female*migr*after	-0.443***	-0.474***	-0.456***	-0.513***	-0.239***	-0.316***
	(0.095)	(0.082)	(0.097)	(0.111)	(0.074)	(0.099)
migr*after	0.057	0.297	0.681***	0.983***	0.342***	0.853***
	(0.544)	(0.409)	(0.042)	(0.208)	(0.119)	(0.325)
female*after	0.019	0.029	-0.010	0.061***	0.017	0.050***
	(0.019)	(0.016)	(0.016)	(0.019)	(0.012)	(0.014)
female*migr	-0.089	-0.024	0.004	0.038		
	(0.071)	(0.059)	(0.057)	(0.078)		
after	0.127**	0.006	-0.062	0.005	-0.057*	-0.140***
	(0.057)	(0.050)	(0.053)	(0.063)	(0.035)	(0.050)
migr	-0.021	0.057	0.033	-0.069		
	(0.047)	(0.039)	(0.036)	(0.057)		
female	-0.225***	-0.310***	-0.240***	-0.363***		
	(0.013)	(0.012)	(0.011)	(0.013)		
Controls	No	Yes	Yes	No	Yes	No
Controls at t=0	No	No	No	Yes	No	Yes
Earnings in 1991	No	No	Yes	No	No	No
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.08	0.31	0.37	0.25	-	-
Observations	13119	13119	9244	12854	13119	12854

Note: robust standard errors are given in parenthesis. *** significant at 1% level, ** significant at 5% level, * significant at 10% level. The dependent variable is the log of individual total annual income (labor income plus social security benefits). Additional controls include age and its square, marital status, number of children less than 14 years old, education, blue-collar and public sector employment dummies, year and region fixed effects. In fixed effects (FE) estimation time-invariant covariates are dropped.

Table 5: Estimation results: employment

	OLS(1)	OLS(2)	OLS(3)	OLS(4)	OLS(5)	FE(6)	FE(7)	FE(8)
female*migr*after	-0.106**	-0.069	-0.164***	0.032	-0.082*	0.034	0.039	-0.014
	(0.046)	(0.045)	(0.053)	(0.045)	(0.046)	(0.049)	(0.049)	(0.051)
migr*after	0.431***	0.526***	0.094***	0.083	0.520***	0.109	-0.087	0.093
	(0.040)	(0.039)	(0.030)	(0.075)	(0.041)	(0.085)	(0.116)	(0.059)
female*after	0.035***	0.021**	-0.003	0.030***	0.031***	0.008	0.019**	0.030***
	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.008)	(0.009)	(0.010)
female*migr	0.012	0.033	0.105***	0.032	0.025			
	(0.037)	(0.036)	(0.037)	(0.036)	(0.037)			
after	-0.107***	-0.123***	-0.060*	-0.100***	-0.112***	-0.088***	-0.077***	-0.100***
	(0.028)	(0.027)	(0.034)	(0.027)	(0.027)	(0.024)	(0.026)	(0.026)
migr	-0.075***	-0.065***	-0.072***	-0.047*	-0.084***			
	(0.027)	(0.026)	(0.026)	(0.026)	(0.027)			
female	-0.137***	-0.030***	0.008	-0.006	-0.100***			
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)			
Controls	No	Yes	Yes	Yes	No	Yes	Yes	No
Controls at t=0	No	No	No	No	Yes	No	No	Yes
Earnings in 1991	No	No	Yes	No	No	No	No	No
Others' income	No	No	No	Yes	No	No	Yes	No
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.03	0.16	0.15	0.17	0.07	-	-	-
Observations	18126	18126	11464	15990	18126	18126	15990	18126

Note: robust standard errors are given in parenthesis. *** significant at 1% level, ** significant at 5% level, * significant at 10% level. The dependent variable is a binary employment status of an individual. Additional controls include age and its square, marital status, number of children less than 14 years old, education, blue-collar dummies, year and region fixed effects. In fixed effects (FE) estimation time-invariant covariates are dropped.

Table 6: Estimation results: weekly hours

	OLS(1)	OLS(2)	OLS(3)	OLS(4)	OLS(5)	FE(6)	FE(7)	FE(8)
female*migr*after	-0.261***	-0.261***	-0.266***	-0.220***	-0.233***	-0.245***	-0.246***	-0.264***
	(0.041)	(0.041)	(0.053)	(0.041)	(0.047)	(0.053)	(0.056)	(0.055)
migr*after	0.329***	0.310***	-0.071	0.219***	0.266***	0.152**	-0.143	0.144**
	(0.038)	(0.039)	(0.053)	(0.041)	(0.044)	(0.077)	(0.105)	(0.074)
female*after	-0.040***	-0.040***	-0.020**	-0.043***	-0.025***	-0.031***	-0.032***	-0.020**
	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)	(0.008)	(0.009)	(0.008)
female*migr	0.003	0.001	-0.015	-0.008	0.006			
	(0.025)	(0.025)	(0.034)	(0.026)	(0.027)			
after	0.006	0.006	0.028	0.007	0.015	0.004	0.002	0.013
	(0.024)	(0.024)	(0.029)	(0.024)	(0.022)	(0.021)	(0.024)	(0.024)
migr	0.036*	0.044**	0.045*	0.046**	0.014			
	(0.020)	(0.020)	(0.025)	(0.021)	(0.021)			
female	-0.130***	-0.145***	-0.145***	-0.129***	-0.140***			
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)			
Controls	No	Yes	Yes	Yes	No	Yes	Yes	No
Controls at t=0	No	No	No	No	Yes	No	No	Yes
Earnings in 1991	No	No	Yes	No	No	No	No	No
Others' income	No	No	No	Yes	No	No	Yes	No
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.10	0.12	0.12	0.14	0.11	-	-	-
Observations	13729	13729	9729	12475	12130	13729	12475	12130

Note: robust standard errors are given in parenthesis. *** significant at 1% level, ** significant at 5% level, * significant at 10% level. The dependent variable is the log of hours worked per week. Additional controls include age and its square, marital status, number of children less than 14 years old, education, blue-collar and public sector employment dummies, year and region fixed effects. In fixed effects (FE) estimation time-invariant covariates are dropped.

Table 7: Estimation results: hourly earnings

	OLS(1)	OLS(2)	OLS(3)	OLS(4)	OLS(5)	FE(6)	FE(7)	FE(8)
female*migr*after	-0.131	-0.179**	-0.064	-0.094	-0.062	0.036	0.051	0.082
	(0.087)	(0.073)	(0.084)	(0.072)	(0.086)	(0.069)	(0.071)	(0.076)
migr*after	0.050	0.314	0.759***	-0.302***	-0.242***	0.434***	0.345**	0.661***
	(0.390)	(0.270)	(0.052)	(0.065)	(0.076)	(0.147)	(0.151)	(0.215)
female*after	0.044**	0.053***	0.014	0.061***	0.058***	0.034***	0.044***	0.048***
	(0.018)	(0.016)	(0.016)	(0.016)	(0.017)	(0.013)	(0.013)	(0.013)
female*migr	-0.075	0.019	0.048	0.017	0.002			
	(0.069)	(0.056)	(0.052)	(0.054)	(0.066)			
after	0.153***	0.042	-0.067	0.040	0.053	-0.023	-0.017	-0.114***
	(0.051)	(0.043)	(0.049)	(0.043)	(0.048)	(0.040)	(0.039)	(0.040)
migr	-0.042	0.015	-0.001	0.027	-0.009			
	(0.045)	(0.040)	(0.035)	(0.039)	(0.048)			
female	-0.073***	-0.151***	-0.090***	-0.116***	-0.157***			
	(0.013)	(0.012)	(0.011)	(0.012)	(0.013)			
Controls	No	Yes	Yes	Yes	No	Yes	Yes	No
Controls at t=0	No	No	No	No	Yes	No	No	Yes
Earnings in 1991	No	No	Yes	No	No	No	No	No
Others' income	No	No	No	Yes	No	No	Yes	No
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.04	0.27	0.37	0.31	0.25	-	-	-
Observations	12461	12461	8984	12279	11088	12461	12279	11088

Note: robust standard errors are given in parenthesis. *** significant at 1% level, ** significant at 5% level, * significant at 10% level. The dependent variable is the log of hourly earnings. Additional controls include age and its square, marital status, number of children less than 14 years old, education, blue-collar and public sector employment dummies, year and region fixed effects. In fixed effects (FE) estimation time-invariant covariates are dropped.

Table 8: Heterogeneity of the effect

	Annual income		Weekly hours	
	OLS	FE	OLS	FE
Married	-0.669***	-0.150**	-0.227***	-0.265***
	(0.096)	(0.076)	(0.054)	(0.070)
	[9605]		[9137]	
Married	-0.910***	-0.192**	-0.318***	-0.142**
with children	(0.119)	(0.101)	(0.060)	(0.073)
	[6679]		[6369]	
Married	-0.453***	-0.157**	-0.160***	-0.265***
before	(0.106)	(0.082)	(0.064)	(0.087)
	[9459]		[8856]	
With children	-0.615***	-0.227***	-0.243***	-0.235***
before	(0.116)	(0.090)	(0.066)	(0.064)
	[8246]		[7710]	
Single	-0.173	-0.097	-0.097	-0.042
	(0.143)	(0.132)	(0.074)	(0.065)
	[3514]		[3338]	
Worked	-0.392***	-0.302***	-0.227***	-0.266***
before	(0.090)	(0.079)	(0.048)	(0.056)
	[11752]		[12195]	

Note: robust standard errors are given in parenthesis, sample size - in brackets. *** significant at 1% level, ** significant at 5% level, * significant at 10% level. Only the coefficient on the third-level interaction in equation (1) is reported. Rows define the subpopulations for which the model is estimated. Additional controls in OLS include age and its square, university degree, general schooling degree, vocational training (reference-apprenticeship), blue-collar worker, public sector employee, year and region fixed effects (as well as others' income in the equation for weekly hours). In fixed effects estimation (FE) time invariant covariates are dropped.

Table 9: The effect of additional interactions

	Annual income		Weekly hours	
	OLS	FE	OLS	FE
married*f*m*a	-0.425***	-0.319***	-0.171***	-0.194**
	(0.101)	(0.119)	(0.063)	(0.084)
female*migr*after	-0.181*	-0.048	-0.102	-0.129
	(0.106)	(0.105)	(0.064)	(0.080)
kids*f*m*a	-0.526***	-0.260**	-0.184***	-0.078
	(0.099)	(0.111)	(0.060)	(0.074)
female*migrant*after	-0.227***	-0.131	-0.133***	-0.213***
	(0.088)	(0.083)	(0.050)	(0.067)
married before*f*m*a	-0.012	0.108	0.115***	0.071
	(0.096)	(0.116)	(0.045)	(0.083)
female*migrant*after	-0.473***	-0.280***	-0.248***	-0.266***
	(0.097)	(0.099)	(0.046)	(0.065)
Observations	13119		12475	
hours for childcare*f*m*a	-0.081***	-0.072***	-0.039***	-0.037***
	(0.019)	(0.022)	(0.008)	(0.010)
female*migrant*after	-0.314***	-0.099	-0.121***	-0.168***
	(0.094)	(0.096)	(0.046)	(0.068)
Observations	10994		10566	
others' inc*f*m*a	-0.0002***	-0.0002***	-0.0001***	-0.00004**
	(0.00003)	(0.00004)	(0.00001)	(0.00002)
female*migrant*after	0.001	0.024	-0.056	-0.178***
	(0.086)	(0.089)	(0.046)	(0.062)
Observations	12937		12475	

Note: robust standard errors are given in parenthesis. *** significant at 1%, ** significant at 5%, *significant at 10% level. "f*m*a" stands for the third-level interaction "female*migrant*after". "Hours for childcare" are reported hours spent per weekday on childcare; "others' income" stands for monthly income of other members of the household. Controls include age and its square, married, number of kids less than 14 years old, university degree, general schooling degree, vocational training (reference-apprenticeship), blue-collar worker, public sector employee, year and region fixed effects (as well as others' income in the equation for weekly hours). In fixed effects estimation (FE) time invariant covariates are dropped.

Table 10: The effect in western Germany

	Annual income		Employment		Weekly hours		Hourly earnings	
	OLS	FE	OLS	FE	OLS	FE	OLS	FE
female*migr*after	-0.074	0.247**	-0.032	-0.074	0.069*	0.212***	-0.061	-0.136
	(0.067)	(0.119)	(0.030)	(0.064)	(0.038)	(0.072)	(0.053)	(0.085)
migr*after	-0.010	0.052	0.023	0.006	-0.002	-0.013	-0.114***	0.007
	(0.048)	(0.101)	(0.021)	(0.052)	(0.025)	(0.065)	(0.041)	(0.075)
female*after	-0.063***	-0.019*	0.016**	0.014**	-0.036***	-0.010	0.008	0.004
	(0.016)	(0.011)	(0.008)	(0.006)	(0.010)	(0.008)	(0.014)	(0.012)
female*migr	0.263***		0.015		0.033		0.058	
	(0.059)		(0.026)		(0.033)		(0.045)	
after	-0.007	-0.095**	-0.052***	0.005	-0.003	-0.039	0.003	-0.011
	(0.028)	(0.048)	(0.013)	(0.026)	(0.016)	(0.026)	(0.023)	(0.047)
migr	-0.070*		-0.030*		-0.004		0.040	
	(0.040)		(0.017)		(0.019)		(0.032)	
female	-0.627***		-0.043***		-0.276***		-0.151***	
	(0.011)		(0.005)		(0.008)		(0.010)	
R^2	0.30	-	0.14	-	0.27	-	0.22	-
Observations	28111		32377		26766		26378	

Note: robust standard errors are given in parenthesis. *** significant at 1%, ** significant at 5%, *significant at 10% level. Controls include age and its square, married, number of kids less than 14 years old, university degree, general schooling degree, vocational training (reference - apprenticeship), blue-collar worker, public sector employee (not for employment equation), year and region fixed effects (as well as others' income in equations for employment, hours and hourly wages). In fixed effects estimation (FE) time invariant covariates are dropped.

Table 11: Additional robustness checks

	Annual income		Employment		Weekly hours		Hourly earnings	
	OLS	FE	OLS	FE	OLS	FE	OLS	FE
	A: controlling for household characteristics							
female*migrant*after	-0.456***	-0.239***	-0.062	0.030	-0.255***	-0.240***	-0.164**	0.028
	(0.080)	(0.073)	(0.044)	(0.048)	(0.041)	(0.052)	(0.071)	(0.069)
Observations	12937		17683		13451		12302	
	B: controlling for occupations							
female*migrant*after	-0.441***	-0.236***			-0.238***	-0.259***	-0.059	0.074
	(0.080)	(0.072)			(0.042)	(0.057)	(0.070)	(0.072)
Observations	12842				12215		12027	
	C: retaining commuters in stayers' group							
female*migrant*after	-0.474***	-0.239***	0.032	0.039	-0.220***	-0.246***	-0.094	0.051
	(0.082)	(0.074)	(0.045)	(0.049)	(0.041)	(0.056)	(0.072)	(0.071)
Observations	13119		15990		12475		12279	

Note: robust standard errors are given in parenthesis. *** significant at 1%, ** significant at 5%, *significant at 10% level. Only the coefficient on the third-level interaction is reported. Controls include age and its square, married, number of kids less than 14 years old, university degree, general schooling degree, vocational training (reference - apprenticeship), blue-collar worker, public sector employee (not for employment equation), year and region fixed effects (as well as others' income in equations for employment, hours and hourly wages in panels B and C). In fixed effects estimation (FE) time invariant covariates are dropped. In panel A household characteristics include household size and log of monthly household income, and the number of children is dropped. In panel B nine major occupational groups (ISCO88) are included (reference - elementary occupations), and blue collar and public sector dummies are dropped. In panel C commuters are included in stayers' group.

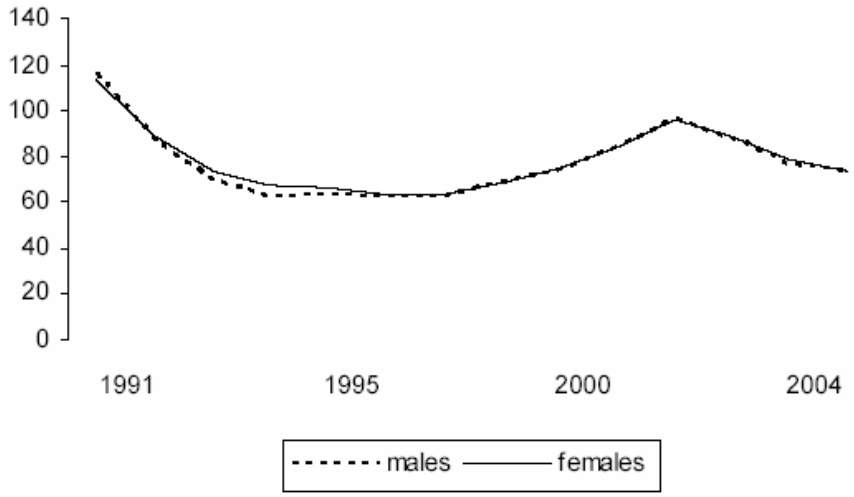

Figure 1: Flow (in thousands) of East-West migrants in Germany by gender, 1991-2004.
Source: Statistisches Bundesamt, 2005.